REPORT

ON THE

HORTICULTURAL GARDENS, LUCKNOW,

FOR THE YEAR ENDING 31st MARCH, 1888.

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II

From

LIEUT.-COL. D. G. PITCHER,

Offg. Dir., Dept. of Land Records and Agri.,

North-Western Provinces and Oudh,

Naini Tal,

To

The CHIEF SECRETARY to GOVERNMENT,

North-Western Provinces and Oudh,

Naini Tal.

Dated Camp Naini Tal, the 25th July, 1888.

Sir,

I have the honor to submit the Annual Report on the Horticultural Gardens, Lucknow, for the year ending 31st March, 1888. The report was received in this office on the 17th July, and was sent to Press on the 25th July, 1888.

2. *Financial.*—The total cash receipts amounted to Rs. 11,029, against Rs. 11,063 in the previous year, and the total expenditure to Rs. 14,460, against Rs. 14,168, adding to the cash receipts Rs. 861 on account of produce distributed gratis, gives the value of the outturn as Rs. 11,890.

3. *Season.*—The weather is reported to have been generally favourable for garden operations, and the arboricultural nursery was freed this year from storms and frosts.

4. *Improvements.*—A portion of the area under fruit having become exhausted was cleared, manured, and re-planted, and the boundary road on the north was realigned and remetalled. The extra expenditure on improvements accounts for the small increase in total expenditure over the previous year.

5. *Fruit culture.*—Experiments which have now been continued for ten years in growing vines on ridges having yielded unsatisfactory results will, save on a small area, be discontinued. Much attention continues to be given to the orange and lemon tribes, and more new varieties were introduced during the year. So also with peaches, Arabian date palms, &c. The tabular statement of results of the fruit crop, showing cost and value realised, is always an interesting one; this year the fruit crop of mangoes and pine apples, the latter being grown in shade under the former, heads the list with a profit of Rs. 52 per acre.

6. *Vegetable and farm culture.*—The Superintendent's remarks as to the value of hill potato seed, when annually imported, deserve attention, at a time when efforts are being made to develop the Government garden at Mohtesar into a nursery for the supply of the best potato seed to the plains. The bazár dealers appear to be very slow in taking advantage of the facilities afforded by the Rohilkhand and Kumaun Railway for opening up this branch of trade. At present the bazár supply of hill seed is fitful and uncertain, and the endeavour will be made, through the Government nursery, to extend a knowledge of the value of annual supplies of fresh hill seed to localities out of the track of the bazár dealers.

7. Experiments with fodder grasses continue to be made ; those relating to " teff, " the new fodder grass from Abyssinia are of special interest, and the account should be read along with that recorded in the report on teff from the Saháranpur gardens. Extracts from both reports should, I may suggest, be forwarded to the Government of India in the Military Department for circulation to Cantonment Committees, managers of grass farms, &c. Experiments were continued in cultivating indigenous grasses from selected seed, but with sò far poor results. The demand for acclimatised vegetable seed followed closely that for last year, while the demand for imported seed increased and was in excess of supply.

8. *Flower culture.*—This section is a record of steady progress calling for no remarks.

9. *Arboriculture, exotic plantation, and date plantation.*—A diminished demand for young trees is reported, but I have always found when on tour that there was a good demand for young mango trees in the districts about Lucknow, and it does not appear to be sufficiently known or appreciated that young trees can be got from the Lucknow nursery for the trouble of carriage and removal. The most interesting note in this section is that on the Japan mulberry (*Broussonetia papyrifera*) in which we possess one of the finest of fibres for paper, &c. It grows luxuriously and is easily raised, but hitherto the treatment of the plant for the extraction of the largest amount of fibre in paying quantities has been a difficulty which we have been trying to solve. For a practical experiment large quantities are required, and the plantations are now beginning to yield sufficient plant. If the fibre can be produced in paying quantities the cultivation of the plant should become popular in these provinces. The combined eucalyptus and date plantation is progressing, but makes slow progress, chiefly owing to the persistent attacks of white-ants, for whose extinction various remedies continue to be tried with partial success.

10. *Apprentices.*—In this section it need only be noted that the establishment was maintained at from 14 to 15, and that two boys trained at the gardens obtained regular employment.

11. *Flower Show at Lucknow.*—Information is given in full detail of this annual show, the success of which is greatly owing to the

exertions of Mr. Ridley, and generally to the support afforded by the existence of the Horticultural Gardens.

12. In conclusion, the outturn of work and general results may be pronounced, as usual, most creditable to Mr. Ridley's management.

I have the honor to be,

SIR,

Your most obedient servant,

D. G. PITCHER, LIEUT.-COL.,
Officiating Director.

Report on the Horticultural Garden, Lucknow, for the year ending 31st March, 1888.

I.—Fruit culture.

1. The area devoted to fruit culture is slightly less than last year, owing to the uprooting and removal of the old vinery. The reason for this step was that the vines were old and worn out, and had ceased to yield any fruit for several years.

2. The experiment commenced in 1878 of planting vines on ridges has been very unsuccessful also, and it is now considered desirable to reduce the area so planted by about one-third, sufficient vines on this system being reserved for further observation and treatment.

3. The ground occupied by the old vinery, 1,273 square yards, has been trenched with liberal quantities of leaf-mould, sweepings, and alluvial clay.

4. Another plot, measuring 765 square yards, near the last, and which was occupied with a number of old and worn out orange trees of the cintra variety, has also been cleared and treated in the same manner as the last-named, and re-planted with 57 young Sylhet orange trees.

5. A third piece, measuring 1,132 square yards, on which were some old and fruitless Malta orange trees, and some of the mortar-ridges were likewise cleared and improved in the same way as the above.

6. A fourth piece, measuring 490 square yards, in the mango orchard has been treated in the same way. The trees had been gradually dying out on this for some years, and as the soil was extremely poor and bad, it was useless filling up the blanks with new trees without renovating the soil.

7. In this way, as opportunity offers, the plots occupied by fruit trees are being put into good condition.

8. As full information on the several orchard fruits cultivated in the garden is given in the remarks column of the statement showing profit and loss on the same, it is needless to give details here.

A.—Improvement of indigenous or acclimatised kinds.

9. Some attention has been given to the question of providing some kind of slight shade to oranges, the object in view being to protect the young fruit from the sun, and prevent the injury caused to a considerable amount of the young fruit by sun-scorching, which invariably occurs in the clear weather immediately following the rains. It is also probable that a little shade would be advantageous during the hot and dry months of April, May, and June, when the trees are severely tried by the strong sun and excessive heat of that period. Oranges.

10. The desideratum is a thinly branched tree of moderate height, which could be planted amongst the orange trees and afford them protecting shade, without impoverishing the soil to too great a degree.

11. At present the cultivated baer (*Zizyphus jujuba*) is thought likely to answer fairly well, being very hardy and able to stand any amount of pruning: it is thought its growth could be regulated to give the necessary shade.

12. The plot of Malta orange mentioned in para. 7 of last year's report has had young baer trees planted among the oranges with the object of testing its utility in the way above-mentioned.

13. The question of improvement by working oranges on different stocks continues to be matter of experiment. During the year the following were planted out for observation :—

Six plants of Sylhet orange budded on " turunj."

Eight pummelow ditto ditto.

Six garden variety of Malta blood orange budded on sweet lime.

Seedling oranges.

14. The total number of seedling oranges planted out is 200 ; nearly all those first planted are good-sized healthy trees, but have failed to blossom yet.

15. Attention continues to be given to raising seedlings of new and good varieties, and during the year seedlings of the Garhwál, Loda, and Mozambique oranges have been raised, the two last from fruit grown at Poona.

16. Three plants of double Malta lemon have also been raised; the seed of this was sent from London by Dr. Bonavia. A number of supposed crosses between Malta lemon and Malta orange, and the former and sweet lime have likewise been raised.

Peaches.

17. The portion of the peach orchard unplanted last year has been filled up with plants of good kind received from Saháranpur.

Thirty-six seedlings raised from selected seed have also been planted out, and others are being raised with the object of securing new and superior varieties.

Baers.

18. All the baer trees fruited abundantly, but gave no evidence of being affected by any of the modes of treatment employed. A long course of cultivation will no doubt be necessary to effect any appreciable improvement in the fruit, assuming that it is improvable.

Plums.

19. Four young trees of a yellow plum, which appears to be a small variety of aloocha, fruited for the first time this year and prove to be an excellent sort, likely to be valuable here on account of its earliness, as the fruit ripened quite a fortnight in advance of alubukhara or any other plum in the garden.

Arabain date palms.

20. So far as securing perfectly ripe fruit goes the results were a repetition of those of previous years, *viz.*, *nil*. A good deal of fruit sufficiently sweet to be eatable was obtained, but of course greatly below the standard of good and thoroughly ripe fruit. All that is wanted to secure the latter quality is dry weather.

21. The seed obtained from the fruit is invariably found to germinate and grow satisfactorily, showing that in its case maturity is attained.

22. The Arab theory of being able to identify male and female plants by raising the seedlings under a covering of stem-fibre was further tested in a sowing mode in the dry season ; the results however as before do not support the theory : the seedlings neither penetrated the covering nor bent under it, but carried it up as they grew.

23. I regret to say that eleven more strong and established trees died during the year. As before, I attribute this to the excessive moisture of the rainy season.

24. The various seedlings raised last year are in pots yet, not being considered strong enough to plant out in permanent sites. The number of seedlings available for distribution and sent out was only 122. There are 32 trees in fruit this year.

25. The following statement gives the approximate expenditure and receipts per acre on several kinds of fruits grown in the garden :—

Name.	Cost per acre.	Value realised per acre.	Profit per acre.	Loss per acre.	Remarks.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Peaches	50 8 0	98 0 0	47 8 0	...	Good crop.
Vines	41 14 0	...	...	41 14 0	Crop failed.
Alubukharas	51 8 0	71 0 0	19 8 0	...	Good crop.
Mangoes and Pineapples ...	20 0 0	72 0 0	52 0 0	...	Mangoes poor crop; pine-apples good.
Lichees	38 8 0	80 0 0	41 8 0	...	Good crop.
Malta oranges	24 8 0	46 13 0	22 5 0	...	A rather poor crop.
Cintra and Sylhet oranges ...	79 8 0	91 12 0	11 4 0	...	Sylhets good; cintras poor.
Malta lemons	37 0 0	41 4 0	4 4 0	...	A moderate crop.
Pummelows	53 13 0	80 11 0	26 14 0	...	Ditto.

B.—Introduction of new kinds.

26. The orange, lemon, and citron trees received last year from the Secretary of State have not been planted out yet, it being thought advisable to nurse the plants in pots till well established before doing so. Oranges.

Two plants have died, and both being the same kind the variety is unfortunately lost, it not having been possible to bud from them.

The other plants are healthy and appear to be well enough established to plant out.

27. From the Superintendent, Agri-Horticultural Garden, Lahore, plants of four varieties of Italian oranges and three varieties of lemons were received.

From the Superintendent, Botanical Garden, Saháranpur, plants in duplicate of eight kinds of good pears, which are said to succeed at Lahore.

Six plants of the double flowering peach.
Five of China orange.
Six of Kandahar pomegranate.

28. From seeds kindly presented by Mr. P. W. Reasoner, Manatee, Florida, a number of plants of the Cattleya-guava (*Psidium cattleyanum*) have been raised.

29. Of the American vines imported in 1886, four more plants have died during the year, and the remaining 10 have made little growth and to all appearance are not likely to be a success. American vines.

C.—Distribution.

30. The statement following gives the names and numbers of fruit trees sent out during the year. With the exception of date palms the totals come so close to those of last year that comment upon them is unnecessary.

As previously noted there was less demand for date plants this year, and besides our stock of established seedlings was small :—

Name.	Sold	Distributed gratis.	Total.
Oranges	1,122	8	1,130
Mangoes	1,034	137	1,171
Malta lemons	250	...	250
Kagzie limes	109	...	109
Sour and sweet limes	23	...	23
Loquats	124	...	124
Vines	108	...	108
Lichees	153	...	153
Peaches	136	...	136
Pine apples	178	...	178
Plantains	48	...	48
Pummelows	105	...	105
Alubukharas	45	...	45
Jack-fruit	168	...	168
Ardunia grandiflora	4	...	4
Papitas	4	...	4
Pomegranates	20	...	20
Rose apples	12	...	12
Wampee	2	...	2
Guavas	88	...	88
Custard apples	30	40	70
Kamrakhs	...	...	...
Figs	26	...	26
Date palm seedlings	122	...	122
Pears	6	...	6
Plums	9	...	9
Monkey jacks	11	...	11
Karaundas	8	...	8
Khirni	25	...	25
Panyala	4	...	4
Total ...	3,974	185	4,159

32. The amount realized by sale of fruit trees during the year amounted to Rs. 1,371, which is slightly below last year's figures. The value of those distributed gratis amounts to Rs. 75-8-0, which, added to actual receipts, gives a total of Rs. 1,446-8-0.

II.—Vegetable and Farm culture.

Vegetable garden.

33. The vegetable garden was kept to the same scale as last year. During the cold season all the best kinds of English vegetables were grown, and in the hot and rainy seasons the principal country vegetables were cultivated.

34. The chief object in growing the latter is to yield a supply of seed for distribution, and opportunity is taken to select the best and finest produce for seed with a view to improvement.

35. As it may not be very generally known that by cultivating English and country vegetables in their respective seasons a constant supply of wholesome fresh vegetables is possible all the year round, the fact of its having been accomplished here for several years is brought to notice.

Owners of gardens who are accustomed to get a supply of fresh vegetables for a short period of the year only, will no doubt be interested in knowing that a constant supply is possible, provided their prejudices are not against country vegetables.

Potatoes.

36. Good results have been obtained by using as seed a particularly good kind of potato from Naini Tal. The name of the variety is not known, but it is of the kidney section, being rather flat and oblong in form; color white. If planted in the plains from the middle to the end of October, or even later, a fairly good crop of tubers is produced, the excellent eating qualities of which are highly spoken of by all who have tried them. A hundred maunds of this seed were distributed among growers in Lucknow, and its reputation appears to be well established here.

37. Experiments have proved that a supply of new seed from the hills yearly is a necessity: tubers raised on the plains and planted the following cold season, gave very poor results, both as to size and quality.

Another point to be noted is, that the crop should not be left in the ground till the weather gets hot; when this was done it was found that a number of the tubers rotted, and the keeping quality of the rest was largely reduced.

38. Last year mention was made of seed of five kinds of native grasses having been collected. Sowings of each were duly made, but I regret to say the results were poor and unsatisfactory. Seed has again been collected for another trial. Indigenous fodder grasses.

39. For the purpose of comparing with the clovers and rye grasses, two ¼ acre plots of oats were sown, one to be cut over before coming into ear as green fodder and the other to be left to grow and ripen a crop of grain and straw in the ordinary way. The grasses having failed, comparison was rendered impracticable, but the results obtained from the two cut plots are here recorded and are per acre :— Oats as green fodder.

		Mds.	s.	c.
Plot left for grain.—Grain	... ...	32	24	0
Bhusa	... ...	68	36	0
Cut over on 5th January.—Green fodder	... ...	336	0	0
Grain	... ...	2	11	0
Bhusa	... ...	11	10	12

The yields from both plots are considerably better than last year, due no doubt to a good manuring of night soil.

40. A small plot each of selected Muzaffarnagar bearded and beardless wheats were sown. Selected Muzaffarnagar wheat.

The results as to yield of grain are close upon those of last year, but there is a great falling off in the weight of straw. A comparison with either the yields of previous years or other wheats cannot fairly be made, as very thin seeding was adopted.

The respective yields per acre are—

		Mds.	s.	c.
Bearded wheat.—Grain	... ...	17	11	12
Bhusa	... ...	25	34	0
Beardless wheat.—Grain	... ...	16	20	4
Bhusa	... ...	22	16	4

(*a*) *Introduction of new kinds.*

41. Sowings on a very small scale were made of an Abyssinian grass called "teff" (*Eragrostis Abyssinicus*). There are two varieties, *viz.*, red-seeded and white-seeded, but in the trials made no noteworthy difference in the growth or yield of green grass was observed. "Teff" or Abyssinian

42. The first sowing was made on the 26th of April, and with copious irrigation made sufficient growth to admit of two cuttings by the 5th of July. The yield per acre working out at 591½ maunds of green grass, which was weighed as soon as the grass was cut. It may be stated that the trial was made in rich garden soil. A trial made this year in the poor soil of the arboricultural nursery has given 107½ maunds per acre from one cutting, grown in 60 days.

43. It is only an annual grass and thrives best in the dry hot weather, but requires free irrigation where this is available; it is practicable to grow a crop of it between the harvesting of rabi and setting in of the monsoon rains—a period when the ground is not taken up with any other crop, so that, unlike other fodder grasses which have been tried, it would not displace any of the crops ordinarily cultivated. Near cantonments and towns a crop of teff could no doubt easily be disposed of in the dry hot weather, either as green grass or dried hay, and the cultivator by drawing a little water with his idle bullocks could provide them and his other cattle with a little green food at a season when such is not usually available.

Where melon, vegetable or sugar-cane cultivation was being conducted, lines of teff might be sown on the edges of the water-runs, and margins of the plots being cut as soon as it interfered with the permanent crops.

A small quantity of seed is in stock, part of which is available for distribution.

Italian rye-grass and cow clover.

44. A supply of seed of the following fodder grasses was procured and tried in the arboricultural nursery:—

Rye grass, giant, evergreen, Italian.
Rye grass imported.
Cow clover, A. sample.
Cow clover, giant, A. sample.
Bromus Schroderii.

A quarter acre of the four first and one-fifth of an acre of the last was sown.

They were sown with the rabi at the end of October. The seed was certainly not at fault, for all came up well and up to December made fairly good growth; for the following six weeks they were almost at a standstill, but commenced to grow again as the weather got warmer in February; growth however was still slow, and by the end of March it was clear that the results would only be poor. Although the ground was kept constantly moist by irrigation, the tops of the grass were burnt up by the sun. The final result has been a crop of dried grass about 6 inches long, in the case of the rye-grasses and next to nothing from the clover.

45. The Bromus did best, a portion of it growing to 2½ feet high and seeding, but the yield was so poor that I do not consider it worth while recording it. Although a good manuring of night-soil was given prior to sowing, still it was clearly evident that the soil was not rich enough to yield good forage crops of any of the above. In rich soils better results would doubtless be obtained, still under the most favorable conditions, I do not see how any of them can profitably be cultivated in this part of India, where they would displace the usual rabi crops, without being so profitable as the latter at present are.

Adelaide.

46. The Adelaide wheat has given considerably better results than last year, the respective outturns per acre being—

1888—Grain,	20	maunds	11	seers.
1887—Do.,	16	do.	23	do.
1888—Bhusa,	26	do.	23¼	do.
1887—Do.,	38	do.	16½	do.

Last year (1887) the seed was sown very thinly; this year 50 seers per acre was used, which is 10 seers per acre less than for country wheats. The crop was a good even one, but shortly before ripening was badly affected with rust. It was later in ripening than country wheat. It is a good hard wheat, liked by natives, and is worth distributing.

Yca Valley Cotton.

47. The plot of Yca Valley Cotton sown in August, 1886, was left for further observation last year, and the plants have kept up an almost continuous growth till now: they are from 8 to 10 feet high and moderately branched. The yield of cotton is, however, almost *nil*, and there seems small propect of a profitable yield of fibre ever being produced.

48. A sowing was made on the 5th of July in the arboricultural nursery. The seed germinated irregularly, and the plants made slow growth during the rains, and though many of them are now 3 to 4 feet high, no bolls have been formed.

49. It appears to be a strong-growing half-hardy perennial shrub, suitable for growing in out-of-the-way places and odd corners without cultivation, where the plants when large would yield a little fibre at little or no expense.

C.—Distribution.

Acclimatized vegetable seeds.

50. There is a slight falling off in the distribution of acclimatized vegetable seeds, but the totals are so near those of last year that no special notice is called for. The details are:—

	lbs.	ozs.
Cauliflower (early)	5	2
Ditto (late)	5	6
Onion, silver skin	8	9
Lettuce	4	13
Tomato	3	10
Spinach	5	13
Cress	1	9
Acclimatized peas and beans	40	0
Ditto Indian-corn	18	8
Cape Gooseberry	1	1

51. The amount realized by sale of the above and 186 packets of country vegetable seeds amounted to Rs. 507-10-0 or Rs 55-1-0 less than last year.

Imported vegetable seeds.

52. Although larger quantities of vegetable seeds were imported this year than last, they were found insufficient to meet the demand for them. Sales amounted to Rs. 1,515-8-9 or Rs. 208-5-9 better than last year.

53. The following were supplied free of charge:—

Manager Pusa Tobacco Farm—

4 ozs. Havannah tobacco seed.

Mr. G. W. Bartlett, Calcutta—

2 ozs. Cauliflower seed.
2 ozs. Carrot seed.

Superintendent, Government Farm, Cawnpore.

2 ozs. Havannah tobacco seed.

III.—Flower Culture.

54. Flower culture in its various branches has received due attention. Constant care and effort are exercised to keep up the character and quality of the several acclimatized flowering annuals which continue to be largely grown for seed. About 20 new and improved kinds and varieties were this year tried and all successfully grown.

55. Bulbous and herbaceous plants flowering and ornamental shrubs and trees have all received considerable attention, both new and old choice kinds have been freely propagated and made available for distribution.

56. In the case of choice roses, I had for several years to report inability to meet indents, but for the last two years our stocks have been more than equal to requirements. The reduction of the price from 12 to 8 annas per plant does not appear to have increased demand.

Hybrid Hippeastrums.

57. The hybrid Amaryllis (Hippeastrums) raised in the garden are, I am glad to say, much appreciated by those who have been supplied with them, so much so that in several instances a second and third supply have been asked for.

58. Hybridising continues to be practised, and a batch of seedlings is raised yearly from the seed secured from the fertilized flowers.

59. With a view to still further improving the strain, half a dozen choice kinds were procured from Messrs. Veitch and Co., London.

C.—Distribution.

60. Compared with last year, there is a slight increase in the quantity of flower seeds sent out.

The amount realized by sale of acclimatized flower seeds amounts to Rs. 881-13-0 or Rs. 14-13-0 more than last year.

61. The approximate value of the plants and cuttings distributed gratis amounts to Rs. 785-8-0, which, added to the value of the fruit trees distributed free of charge, makes the total value of free distribution for the year to be Rs. 861-0-0.

62. Details of the distribution of seeds and plants are furnished in Appendix IV.

IV.—Arboriculture.

(*b*) *Arboricultural Nursery.*

63. The condition of the arboricultural nursery and its contents are, I am glad to say, in much better condition than was the case last year. No injury was caused to the young trees by storm or frost, as was the case in 1886-87.

64. The land unoccupied by trees was utilized for carrying out the experiments with fodder grasses and other crops mentioned in paras. 38 to 49.

65. A portion is also taken up with the following grafted mango trees, which are intended for grafting from when the trees are large enough for scions to be taken from them :—

	Trees.
Langra	40
Malda (large varieties)	22
„ (small) „	22
Malihabad	33
Bombay	66
Total ...	183

66. I regret having to report a diminished demand for the young trees grown in the nursery. The total number sent out during the year is only 2,254 against 7,067 last year. The total number of trees in stock at the close of the year is 15,546, against 9,513 last, which shows an increase of 6,027 trees of all kinds.

c.—Distribution.

67. Details of the trees in stock, raised and distributed, are furnished in the following statement :—

Statement showing the number of trees raised and distributed from Arboricultural Nursery during the year 1887-88, *and those now in stock.*

Name of trees.	1 Total in nursery on 31st March, 1887.	2 Distributed during 1887-88.	3 Died and cut down during 1887-88.	4 Balance on hand on 31st March, 1888.	5 Raised during 1887-88.	6 Total in nursery on 31st March, 1888.
Amb	2,300	1,511	29	760	4,600	5,360
Ambili	620	129	...	491	600	1,091
Mahwa	160	24	...	136	420	556
Gular	1,065	23	852	190	..	190
Kathal	1,077	282	50	745	...	745
Jamun	1,095	225	...	870	700	1,570
Pakar	340	25	...	315	1,000	1,315
Peepal	1,080	22	174	884	800	1,684
Bargad	285	3	42	240	500	740
Bel	697	2	...	695	...	695
Kaitha	110	...	...	110	...	110
Divi-divi	14	8	6	...	...	...
Shah-toot	670	...	670	...	...	...
Eucalyptus	...	...	...	...	600	600
Seeshum	...	...	...	...	600	600
Mahogany	...	...	...	...	260	260
Momseri	...	...	...	...	30	30
Total ...	9,513	2,254	1,823	5,436	10,110	15,546

68. The following seeds were distributed gratis :—

To Pandit Ajudhia Prasad, Indalpur—

1lb date seed.

To Dr. Clark, Nusseerabad—

2lb inga dulcis seed.

To Panchdeo Pandey, Reoti School, Ballia district—

1 packet date seed.

To Babu Nitya Gopal Mukerjee, Berhampur—

¼lb divi-divi seed.

Sold to several persons—

155¼lb inga dulcis seeds.

69. The estimated expenditure on the Arboricultural Nursery for the year was Rs. 1,025, out of which Rs. 959-1-6 was spent, leaving a saving of Rs. 65-14-6.

70. The receipts for the year amounted to Rs. 225-4-6 or Rs. 128-1-11 less than last year. Details of expenditure and receipts are given in appendix II.

EXOTIC PLANTATION.

71. Though in a much better condition than last year, the experimental acre of divi-divi is yet far from being in a satisfactory state of growth. All the trees threw up a good young growth from the base, and where too numerous, these were thinned out. Divi-divi.

About three-fifths of the trees have again had their leading growths killed back for about one-half their length, and the general appearance of the plantation is unthrifty.

72. The line of 15 grafted carobs has made fair progress. Grafted carobs.

73. With the exception of a few square yards, the area taken up for paper mulberry was planted during the rains. On a small portion of the plantation the trees first planted have done well and are ready for cutting for fibre. The remaining portion of the plantation has improved somewhat, and it is anticipated that during the next rainy season all the trees at present planted will get thoroughly established. Paper Mulberry (Broussonetia papyrifera).

About half of the plantation was manured in the autumn with decayed refuse from the paper mills, which the Directors of the mill very kindly gave free of charge.

74. It has been found that the bark of this plant can readily be removed from stems of a moderate thickness by passing them through the iron-rollers of a sugar-cane mill. A sample of bark taken off in this way has recently been submitted to the Manager of the paper-mills, who has asked to be supplied with a ton of the same, a request which will shortly be complied with.

75. No additions in the way of new exotic trees were made during the year.

76. The names and conditions of the kinds previously planted are given in the following statement :—

Names of kinds.	Number alive last year.	Number alive this year.	Remarks.
Acer negundo	3	3	Very little growth.
Antidesma Dallachiana	1	3	Two sprouted again ; unthrifty.
Arabian Date Palms	23	22	One dead, rest doing well.
Brachychiton populneum ...	...	4	Poor growth.
Broussonetia papyrifera... ...	12	12	One tree good, rest poor growth.
Catalpa bignonoides var speciosa ...	3	3	Very little progress.
Eucalyptus resinifera	9	9	Doing well.
Ditto rostrata	18	18	Ditto.
Garcinia Roxburghii	6	6	Very little progress, healthy.
Maclura aurantiaca	4	4	Slow growth, healthy.
Owenia cerasifera	4	4	Unthrifty.
Pterocarpus marsupium... ...	4	4	Two fine trees, the other two healthy.
Pithecolobium saman	25	25	Doing well.
Rhus Thunbergii	11	10	Poor growth, worthless ; to be rooted up.
Swietenia mahogani	2	2	Very poor specimen ; to be taken up.
Schinus terebinthyfolius ...	2	2	Fair growth.

77. The allotment for the exotic plantation for the year was Rs. 100 which was all used.

78. The receipts amounted to Rs. 16.

Details of expenditure and receipts are given in Appendix III.

Date plantation.

Arabian date palms.

79. The strip of land on the east side of the date plantation, which was reported as unplanted last year remains unplanted still, as the plants intended for it are not yet strong enough for putting out.

80. Of the 1,527 plants alive at the end of last year no less than 130 have died.

Seventy of the deaths are among the small plants last planted, and their failure may be placed to their having been too small to bear the exposure attendant on planting out.

81. The other failures are due to injury caused to the plants by excessive moisture during the rains, the centre of the plants being destroyed apparently by damp. The number of plants alive at the end of the year is 1,397.

Imported offsets.

82. The imported offsets, I regret to say, have all failed except two, and only two out of a dozen from garden trees put down at the same time appear to have taken root.

83. An experiment is being made with another dozen planted out in the open in permanent sites with a covering of grass for shade. At present they do not look promising.

Eucalyptus citriodora.

84. With regard to Eucalyptus citriodora, I regret having again to report heavy loss of young trees by white-ants. Out of 3,650 seedlings planted in June, 2,000 only have survived.

Phenyle was tried as a protection, but proved of temporary if any real service, and on the score of cost could not be repeatedly applied.

85. A decoction made from the Russ plant (Adhatoda vasica) was also largely used, but as phenyle had been previously applied, its effectiveness or the contrary have not been clearly established. A further trial will be made with it.

86. The beneficial effect of mustard cake as a stimulant has, however, been very clearly proved; four rows in the centre of this year's planting were treated with powdered cake. One chittak was given to each plant, with the soil placed immediately around the roots at planting, the effect was soon apparent in the greater vigor, growth, and more healthy appearance of the trees, compared with those on each side planted at the same time. This improved position the plants still maintain, and the mortality from white-ants has been considerably less than in the contiguous rows.

87. Surface manuring with night-soil has also had good effect on the trees.

88. Several of the trees first planted (1885) have produced seed this year, so that there is every prospect of the difficulty about the seed supply disappearing.

89. The total number of trees of Eucalyptus citricdora now planted out and alive is 2,900,—a large stock of seedlings is in course of preparation for planting out during the coming rains.

90. On the west boundary line a row of Eucalyptus resivifera has been planted, of which 29 trees are now alive, and on the south side casuarina has been put down, 48 trees of which are living.

91. The allotment for the year was 500, of which Rs. 473-6-8 was spent, leaving a saving of Rs. 26-9-6.

V.—Financial Results.

Horticultural Garden.

92. The total estimated receipts for the year were Rs. 10,000, and the total actual receipts amounted to Rs. 11,028-10-6, or Rs. 1,028-10-6 over the estimate. This does not include the sum of Rs. 1,500 on account of Superintendent's salary contributed annually by the Nazúl Department.

93. The total estimated expenditure for the year was Rs. 14,500, and the total actual expenditure amounted to Rs. 14,460-6-0, or Rs. 39-10-0 less than the estimate.

94. There was no difference in the interest on Government notes.

95. The receipts from rent of land were more by Rs. 39-13-3.

96. The receipts from subscription were less by Rs. 152.

97. The receipts from sale of garden produce, as detailed in Appendix I, amounted to Rs. 10,255-14-7, or Rs. 1,143-14-7, over the estimate and Rs. 14-15-6 more than the amount realized for the same produce last year.

98. The total receipts from all sources were less than those of last year by Rs. 34-11-9.

Subscribers.

99. There was an increase of two in the number of second class subscribers. The number of first class subscribers was the same as last year.

100. The number of each class stands as below :—

First class	...	...	...	9
Second class	...	...	...	13

Apprentice boys.

101. Out of the 14 apprentices who were in the garden at the end of last year, four left and one was transferred to the Wingfield Park. One of the four who left has taken service as mali to Raja Shaban Ali, of Salempur.

102. No reason for leaving was given by the four boys above mentioned. Five fresh boys have been entertained, which brings up the number to 15 at the end of the year.

Flower show.

103. The annual flower show was held on the 28th of February, and was in every way a success. Hitherto no record has been made of the number of exibits in the various classes, the absence of which renders accurate comparison one year with another impossible. This year the number of exhibits in each class was recorded and are as follows :—

Section I, Public Garden foliage and flowering pot plants ...	22	collections.
Ditto ditto cut flowers	12	ditto.
Section II, Private Garden foliage and flowering pot plants ...	70	ditto.
Ditto ditto cut flowers	107	ditto.
Ladies Prizes number of exhibits...	13	
Section III, vegetables, Private Gardens, number of exhibits ...	336	
Section IV, vegetables, Public and Jail Gardens, number of exhibits...	105	
Section V, fruits (open to Public and Private Gardens) number of exhibits	46	
Total exhibits of all kinds ...	711	

104. It is matter for satisfaction to be able to record a growing interest on the part of the general public in the success of these shows. One manifestation of this is the increased and growing spirit of competition which each exhibition calls forth.

105. The show account stands as below :—

	Rs.	a.	p.
Balance from 1887	219	4	11
Contributed by European subscribers	341	0	0
Ditto native ditto	184	0	0
Ditto Lucknow Municipality	50	0	0
Ditto balance from Exhibition Fund from the Secretary ...	65	0	0
Sale of tickets	132	12	0
Total ...	992	0	11

Expenditure.

				Rs.	a.	p.
Distributed in prizes				485	0	0
Printing schedules, tickets, and advertising				48	11	0
Construction and repairs to show-stands				132	5	8
Miscellaneous				106	11	4
Balance with Deputy Commissioner				219	4	11
			Total ...	992	0	11

Roads.

106. The boundary road on the north side of the garden, which has long been in bad order, has been straightened and metalled with kankar, with the effect of greatly improving the appearance of that side of the garden. The length metalled is 1,440 feet, with a width throughout of 12 feet.

Season.

107. Normal weather was experienced during the year, and on the whole was favorable to the garden and crops grown in it.

Plants and seeds contributed.

108. The following is a list of contribution of seeds and plants to the garden during the year :—

From Mrs. Boileau, Stanfield Hall, England—

Choice flowering bulbs 118.

From W. Clifford, Esq., District Superintendent of Police, Bara Banki—

A climbing plant, supposed cure for snake-bite.

From G. W. Bartlett, Esq., Calcutta—

Ornamental plants 21, seed packet 1.

From Mr. Bourki, Chandousi—

Bulbs 6.

From Dr. Bonavia, England—

Seeds of orange, lemon, and vine, 3 packets.

From Director, Royal Botanical Garden, Calcutta—

Ornamental shrubs and plants 24.
Tree seeds six kinds 5½lbs.
Palm „ 11 kinds 8¾lbs.
Seed of ornamental shrubs and plants, 63 packets.

From Director, Botanical Department, Northern India, Saháranpur—

Date palm seed, 1 maund.

From Dewan of Rewah—

Seeds of a large kind of turyee, 1 packet.

From Colonel May, 5th B. N. I., Lucknow—

Burma orchids, 52 pieces.

From C. Nickels, Esq., Pussewa Factory, Jaunpur—

Magnolia grandiflora plants, 2.

From J. Highway, Esq., Fyzabad—

Caladium bulbs, 4.

From Messrs. Reasoner Brothers, Manatee, Florida, U. S. A—

Seeds of trees, ornamental shrubs, plants, and fruit trees, 73 packets.
Palms, 6 packets.
Bulbs, 14 do.

From R. Rose, Esq., Lucknow—

Orchids, 4 plants.
Ornamental plants, 9.

From Honorary Secretary, Agri-Horticultural Society, Madras—

Seeds of ornamental trees and shrubs, 30 packets.
Cuttings of Cactai, 3.
Seed of Ceara-rubber (Manihot Glaziovii) 5 lbs.

From Superintendent, Botanical Garden, Saháranpur —

Ornamental trees and shrubs, 149 plants.
Fruit trees, 4 kinds, 32 plants.
Peach-cuttings, 1 bundle.
Rose do., 12 kinds.
Seed of flowering annuals, 76 packets.
Do. of ornamental grasses, 6 do.
Do. of fodder grasses, teff, 6½ lbs.
Do. of vegetables, 10 packets.
Do. of timber and ornamental trees 8 kinds 3½ lbs.

From the Superintendent, Government Horticultural Garden, Lahore—

Seeds, Livistona altissima, 50 packets.
Aleurites Moluccana, seeds, 50.
Plants, orange and lemon trees, 10.
Bulbs of sorts, 24.

From the Superintendent, Raj Garden, Durbhanga—

Ornamental and foliage plants, including palms and ferns, 180.

From the Superintendent, Taj Garden, Agra—

Stephanotis floribunda, 8 plants.

From Dr. Temple Wright, Civil Surgeon, Jaunpur—

Bulbs, 5.
Ornamental plants, 3.

Fom Colonel Tweedie, Lucknow—

"Blacksmith" potato two, vegetable seeds 2 packets.

From Messrs. Vilmorin Andrieux and Company, Paris—

A collection of vegetable seeds.

The following plants and seeds were purchased during the year :—

From Mr. E. Benary, Erfurt, Germany—

Seeds of choice palms, 9 packets.
Do. flowering annuals, 17 packets.

Messrs. Haage and Schmidt Erfurt, Germany—

Seed of flowering annuals and ornamental plants, 18 packets.

Messrs. John Cranston and Company, King's Acre, Hereford, England—

Choice and new roses, 36 plants.

Messrs. James Veitch and Sons, Chelsea, London—

Hybrid Amaryllis bulbs, 6.

Messrs. Vilmorin Andrieux and Company, Paris—

Seeds of choice flowering annuals, 16 packets.
Lucerne grass seed 1 bushel.

From Messrs. Sutton and Sons, Reading, England—

A collection of vegetable seeds, 72 kinds.
Ditto ditto, 19 ditto. } Weighing 28¾ lbs.
Rye grass seed, 2½ bushels.
Clover seed, 28 lbs.
Bromus Schrœderi, 12 lbs.

From Messrs. Landreth and Sons, Philadelphia, U. S. A.—

60 collections of vegetable seeds of 22 kinds.
35 ditto ditto 32 ditto.
7 kinds table corn seeds.
16 ditto vegetable seeds, weighing 187½ lbs.

Seeds sent out gratis.

109. To R. Crossling, Esq., Penarth Nurseries' Cardiff, England—

1 lb. Livistona Mauritiana.
2 ozs. cupressus torrulosa.

To Station Hospital Garden.

Chunar 12 packets flower seeds.

To Superintendent, Botanical Garden, Saháranpur—

2 packets tree seeds.
9 ditto flower seeds.

To Superintendent, Botanical Garden, Calcutta—

1 packet Eucalyptus citriodora.
3½ ozs. ditto resinifera.
43 packets flower seeds.

To Secretary, Agri.-Horticultural Society, Madras—

1 packet Biota falcata.

To Superintendent, Horticultural Garden, Lahore—

1 packet of Biota falcata.

To Superintendent, Government Farm, Cawnpore—

24 packets flower seeds.

To Messrs. Reasoner Brothers, Florida—

1 packet Kleinhovia Hospita.

To —— Bartlett, Esq., Calcutta—

87 packets flower seeds.

To C. Nickels, Esq., Pussewa Factory, Jaunpur—

3 packets flower seeds.

To Mr. Phillips, Bhinga—

13 packets flower seeds.

M. RIDLEY,
Superintendent, Horticultural Garden, Lucknow.

APPENDIX I.

Statement showing the Receipts and Expenditure of the Horticultural Garden, Lucknow, for the year ending 31st March, 1888.

Receipts.	Actuals of 1886-87.	Sanctioned estimate for 1887-88.	Actuals of 1887-88.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Interest on Government notes	104 14 8	108 0 0	104 14 8
Rent of land	345 8 6	300 0 0	339 13 3
Subscriptions	372 0 0	480 0 0	328 0 0
Total ...	822 7 2	888 0 0	772 11 11
SALES.			
On cash payment.			
Fruit trees	1,416 1 3	...	1,371 0 0
Vegetable and flower seeds (acclimatised)	1,423 11 0	...	1,389 7 0
Ditto ditto (imported)	1,299 13 0	...	1,515 8 9
Ornamental plants and trees	3,144 15 6	...	3,099 2 6
Vegetables	157 7 3	...	275 9 0
Cut flowers	236 9 0	..	207 4 3
Fruit	800 13 3	...	945 15 6
Wood and grass	25 3 1	...	...
Miscellaneous	1,722 13 9	...	1,451 15 7
Total receipts in cash ...	10,227 7 1	9,112 0 0	10,255 14 7
Credit account.			
Acclimatised seeds	6 0 0	...	...
Imported vegetable seeds	7 6 0	...	...
Miscellaneous	0 2 0	...	...
Total receipts in credit ...	13 8 0	...	...
Total receipts in cash and credit ...	11,063 6 3	10,000 0 0	11,028 10 6

Expenditure.	Actuals of 1886-87.	Sanctioned estimate for 1887-88.	Actuals of 1887-88.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Superintendent	3,000 0 0	3,000 0 0	3,000 0 0
Writers and others	431 7 0	492 0 0	483 14 0
Gardeners and Assistants	1,951 1 3	2,406 0 0	2,302 2 0
School for native gardeners	552 6 0	875 0 0	595 14 3
Variable labor	2,194 4 9	1,776 0 0	1,949 0 6
Purchase of seeds and plants	3,032 13 11	2,400 0 0	2,612 0 5
Ditto of live stock	52 8 0	100 0 0	...
Ditto of manure	23 0 0	100 0 0	49 14 0
Service stamps	140 0 0	121 0 0	128 6 0
Miscellaneous	2,503 13 6	2,500 0 0	2,713 11 11
Maintenance of premises	256 6 9	730 0 0	553 0 11
Travelling allowance	...	...	72 6 0
Total ...	14,137 13 2	14,500 0 0	14,460 6 0

M. RIDLEY,

Superintendent, Horticultural Garden, Lucknow.

APPENDIX II.

Statement showing the Receipts and Expenditure of the Arboricultural Nursery, Lucknow, for the year ending 31st March, 1888.

Receipts.	Amount.	Expenditure.	Amount.
	Rs. a. p.		Rs. a. p.
Miscellaneous	225 4 6	Purchase of seeds and plants	18 12 6
		Pay of gardeners	239 8 0
		Cost of watering	91 2 3
		Miscellaneous	609 10 9
Total ...	225 4 6	Total ...	959 1 6

M. RIDLEY,
Supdt., Hortl. Garden, Lucknow.

APPENDIX III.

Statement showing Receipts and Expenditure of the Exotic Plantation, Lucknow, during the year ending 31st March, 1888.

Receipt.	Amount.	Expenditure.	Amount.
	Rs. a. p.		Rs. a. p.
Sale of fruit	16 0 0	Labor	71 3 0
		Contingencies	28 13 0
Total ...	16 0 0	Total ..	100 0 0

M. RIDLEY,
Supdt., Hortl. Garden, Lucknow.

APPENDIX IV.

Abstract of distribution list for 1887-88.

Number.	Name of department, &c., supplied.	Plants.									Seeds.							
		Fruit.			*Ornamental and timber trees.*		*Ornamental trees and shrubs.*									*Total.*		
		Plants.	Cuttings.	Strawberries.	Plants.	Cuttings.	Plants.	Cuttings.	Bulbs and tubers.	Total.	Vegetable.	Flower.	Fruit.	Tree and shrub.	Miscellaneous.	Number of packets.	Weight.	
																	lbs.	ozs.
1	Arboriculture	137	...	...	...	...	...	...	...	137	...	...	...	...	...	...	...	
2	General Public	2,807	...	...	582	...	7,143	753	3,758	15,043	2,594	3,947	4	120	4	6,669	809	0
3	Government and Public Gardens in India,	1,090	...	...	707	...	2,112	138	...	4,047	412	1,520	...	9	2	1,943	150	11
4	Ditto in other countries,	25	...	...	...	...	...	...	...	25	24	...	...	3	...	52	34	8
5	Jails	...	...	...	...	...	...	...	...	...	115	4	...	..	1	120	38	0
	Total ...	4,059	...	...	1,289	...	9,255	891	3,758	19,252	3,145	5,471	4	132	7	8,784	1,032	3

M. RIDLEY,
Supdt., Hortl. Garden.

ORDERS OF GOVERNMENT.

No. $\frac{1302}{1-434}$ of 1888.

From

The CHIEF SECRETARY to GOVERNMENT,

N.-W. Provinces and Oudh,

To

The DIRECTOR of LAND RECORDS and AGRICULTURE,

N.-W. Provinces and Oudh.

Dated Naini Tal, the 8th September, 1888.

Sir,

Revenue Dept.

I am directed to acknowledge the receipt of the report on the Horticultural Gardens at Lucknow for the year ending the 31st March, 1388, submitted with your letter No. 4279, dated 23rd August, 1888, and to state that Mr. Ridley's careful management of the gardens is commended.

2. The results of the experiments with the Abyssinian fodder grass will doubtless be observed by the Government of India, to which copies of the report are submitted.

3. With reference to paragraph 9 of your letter of the 25th July, appended to the report, I am to state that you should take steps to make it known through District Officers that young trees can be obtained from the Lucknow nursery gratis.

I have the honor to be,

Sir,

Your most obedient servant,

J. R. REID,

Chief Secy. to Govt., N.-W. P. and Oudh.